Interactive Systems (CSE573)
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What are the challenges that the paper is solving?

This research focuses on improving real-world AI systems (those already in use and those that may be developed in the future) by making them more user-friendly. The authors propose 18 guidelines to address the inherent challenges of probabilistic AI, which can make mistakes and confuse users ranging from typos corrected by autocompletion to potentially dangerous situations in self-driving cars.

Research methods and methodology used

Phase-1

To understand the best practices for human-centred AI design, the authors' research approach consisted of the following elements:

- They gathered AI design guidelines from two sources: internal company documents and publicly available external resources. They then categorised them based on recurring themes. Additionally, they selected samples of AI products, both internally developed and from external sources, and evaluated them against the identified themes from the collected guidelines.
- They analysed internal customer feedback on their company's AI products, including reviews and bug reports. This provided valuable insights into real-world user experiences.
- They complemented their findings with recent industry publications and editorials on AI design, along with a review of relevant academic research in this field.

After this 3 researchers classified the concepts into 35 clusters using affinity mapping, however, they were reduced to 20 after filtration(removed clusters that were too vague or too niche).

Phase-2

The initial research yielded 20 guidelines. To ensure the guidelines were clear, easy to understand, and avoided redundancy, the researchers consolidated overlapping concepts. This resulted in a streamlined set of 18 guidelines.

Phase-3

To assess the guidelines' effectiveness (applicability and clarity), researchers conducted a user study with 49 HCI professionals. Participants evaluated the guidelines against various AI-powered products, using a 5-point scale ("clearly violated" to "clearly applied") and providing explanations for their ratings. Additionally, participants were incentivised to include screenshots for illustrative purposes.
After looking at the results of this study, the guidelines were revised and improved for clarity.

Phase-4

To assess clarity and usability, 11 HCI/UX professionals (designers, researchers, and product planners) reviewed the revised guidelines. They compared original and revised versions, evaluated confusing guideline pairs, and rated difficulty in distinguishing similar pairs. Revisions improved clarity for most guidelines, but some experts found Guidelines 1 and 2 still needed refinement

Main results

By testing these guidelines on real products with HCI professionals, they found evidence that the guidelines are relevant across various product categories. This suggests the guidelines can be useful for designing user-centred AI products. The analysis also identified areas for improvement, such as the need for clearer explanations in AI systems and a better understanding of when explanations are not desirable.

Critique

- The study included of 49 HCI professionals, all participants were from a single company. However, I believe that including participants from diverse companies and backgrounds could provide a broader perspective on the applicability of the guidelines.
- Additionally, the evaluation relied only on HCI professionals. Future research could benefit from incorporating usability testing with non-HCI participants, as they would be the target users of these AI systems. Their insights would be invaluable in understanding user confusion and the effectiveness of the guidelines in real-world scenarios.
- The applicability of the guidelines to AI systems without graphical interfaces (e.g., voice assistants) requires further investigation. Tailoring guidelines for different interface types may be necessary, but this could lead to redundancy and complexity. Exploring methods for creating adaptable guidelines that can be applied across various interfaces would be a valuable next step.